

Long-term cost-effectiveness analyses of once-weekly semaglutide 1 mg versus empagliflozin 25 mg for treatment of type 2 diabetes in three countries: Bosnia and Herzegovina, Greece, and Slovenia

Long-term cost-effectiveness analyses of once-weekly semaglutide 1 mg versus empagliflozin 25 mg for treatment of type 2 diabetes in three countries: Bosnia and Herzegovina, Greece, and Slovenia
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Background and Aims

Background

- Diabetes is an ongoing and increasing healthcare challenge. It is estimated that in Bosnia and Herzegovina, Greece, and Slovenia 112,400; 12,900; and 12,100 people, respectively, had diabetes in 2019, and within Europe there is predicted to be a 70% increase in diabetes prevalence by 2030 [1]. Type 2 diabetes accounts for approximately 90% of cases [1].
- In 2019, the absolute patient years diabetes-related expenditure was EUR 301, USD 1,302, and USD 2,071 in Bosnia and Herzegovina, Greece, and Slovenia, respectively [1]. Therefore, it is vital that healthcare providers choose cost-effective therapies to optimize health outcomes with limited resources.
- Treatment guidelines released by the European Association for the Study of Diabetes (EASD) recommend therapy of glimepiride-pioglitazone (G/P) or empagliflozin and sulfonylurea combination (E/S) in addition to oral diabetes therapies for patients with type 2 diabetes [2].
- Once-weekly semaglutide and once-daily empagliflozin are, respectively, GLP-1 receptor agonist and SGLT2 inhibitor with strong evidence of a cardiovascular benefit compared with diabetes. There fore, in certain contexts a decision may be recommended to progress the either once-weekly semaglutide or empagliflozin, and comparative data on the relative effectiveness and cost effectiveness of these interventions will be important in order to make informed decisions.

Aims

This analysis aimed to assess the long-term cost-effectiveness of once-weekly semaglutide 1 mg versus empagliflozin 25 mg for the treatment of patients with type 2 diabetes in the three countries.

Methods

- Cost-effectiveness was evaluated using the HYVIA (HYper-value Model for cost) with clinical and cost outcomes projected over a 30-year time horizon.
- The baseline patient characteristics and treatment effects of once-weekly semaglutide 1 mg and empagliflozin 25 mg were based on randomised comparison conducted using patient-level data (Table 1) [1].

Table 1 Treatment effects associated with once-weekly semaglutide 1 mg and empagliflozin 25 mg in the search

Outcome	Empagliflozin 25 mg		Empagliflozin 25 mg
	95% CI	95% CI	
QALYs	0.001 (0.000, 0.002)	0.001 (0.000, 0.002)	0.001 (0.000, 0.002)
Cost (EUR)	-16,112.27	-11,124.75	-11,124.75
Cost (USD)	-17,112.27	-11,812.27	-11,812.27
Quality-adjusted life expectancy	0.001 (0.000, 0.002)	0.001 (0.000, 0.002)	0.001 (0.000, 0.002)
Incremental cost-effectiveness ratio (ICER)	1,561.61	1,012.90	1,012.90
ICER (USD)	1,661.61	1,112.90	1,112.90
Incremental quality-adjusted life expectancy (QALY)	0.001 (0.000, 0.002)	0.001 (0.000, 0.002)	0.001 (0.000, 0.002)
ICER (USD)	1,661.61	1,112.90	1,112.90

Results

- In Bosnia and Herzegovina, Greece, and Slovenia, once-weekly semaglutide 1 mg was associated with increased quality-adjusted life expectancy compared with empagliflozin 25 mg.
- Once-weekly semaglutide 1 mg was associated with an increase in life expectancy of 0.001, 0.001, and 0.001 years in Bosnia and Herzegovina, Greece, and Slovenia, respectively, compared with empagliflozin 25 mg.
- Daily quality-adjusted life expectancy was associated with an increase in life expectancy of 0.001 years (QALYs) in Bosnia and Herzegovina, and increase by 0.001 years in Greece and Slovenia.
- Quality-adjusted life expectancy was associated with an increase in life expectancy of EUR 1,562 and EUR 1,013 per patient, respectively, compared with empagliflozin 25 mg. The increased primary costs of once-weekly semaglutide 1 mg were partially offset by avoided complication costs.
- In Greece, treating patients with once-weekly semaglutide 1 mg was associated with cost savings of EUR 1,112 per patient compared with empagliflozin 25 mg, as increased primary costs were mostly offset by avoided complication costs.
- Once-weekly semaglutide 1 mg was considered dominant versus empagliflozin 25 mg in Greece, and was considered cost-effective with incremental cost-effectiveness ratio of EUR 1,562 and EUR 1,013 per QALY gained in Bosnia and Herzegovina and Slovenia, respectively (Table 2).

Table 2 Results of the base case analysis

Discussion and Conclusions

Discussion

- Over a patient's lifetime, treatment with once-weekly semaglutide 1 mg was associated with increased quality-adjusted life expectancy compared with empagliflozin 25 mg, as a result of lower diabetes-related complications.
- The analysis did not include a comparison using patient-level data, which allowed potential prognostic factors and other modifiers to be included, which is not possible when aggregated data is used. However, it should be noted that effect modification is not typically controlled for in the same way as confounding variables.
- Furthermore, the use of individual patient data allows a wider range of outcomes to be assessed (such as lipid profiles), that would not be possible based on published trial data as these are infrequently reported in the peer-reviewed literature, giving a more accurate reflection of the differences in risk factors for diabetes-related complications.
- It should be noted that it would be useful to include an assessment of cardiovascular benefits observed with once-weekly semaglutide and empagliflozin in the recent cardiovascular outcomes study [1,3].
- However, while the present study predominantly uses clinical treatment pathways (initialisation from a GLP-1 receptor agonist or SGLT2 inhibitor to basal insulin and/or added other potential algorithms, the simplified approach was used to ensure the robustness of the relative cost-effectiveness of the two interventions.
- A potential limitation of the present analyses is the projection of long-term outcomes from short-term data, but this is an essential tool of health economic modelling with a maximum of the best available patient-level data to inform decision making in the absence of long-term clinical trial data.

ABSTRACT REFERENCES CONTACT AUTHOR GET POSTER

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BACKGROUND AND AIMS

Background

- Diabetes is an ongoing and increasing healthcare challenge. It is estimated that in Bosnia and Herzegovina, Greece, and Slovenia 311,400, 619,900, and 122,500 people, respectively, had diabetes in 2019, and within Europe there is predicted to be a 15% increase in diabetes prevalence by 2030 [1]. Type 2 diabetes accounts for approximately 90% of cases [1].
- In 2019, the annual per patient mean diabetes-related expenditure was USD 901, USD 1,660, and USD 2,071 in Bosnia and Herzegovina, Greece, and Slovenia, respectively.¹ Therefore, it is essential that healthcare providers choose cost-effective therapies to optimize health outcomes with limited resources.
- Treatment guidelines released by the European Association for the Study of Diabetes (EASD) recommend the use of glucagon-like peptide-1 (GLP-1) receptor agonists and sodium-glucose cotransporter-2 (SGLT-2) inhibitors as second-line therapies for patients with type 2 diabetes [2].
- Once-weekly semaglutide and once-daily empagliflozin are, respectively, a GLP-1 receptor agonist and a SGLT-2 inhibitor with strong evidence of a cardiovascular benefit in patients with diabetes. Therefore, in certain contexts clinicians may be recommended to prescribe either once-weekly semaglutide or empagliflozin, and consequently data on the relative effectiveness and cost-effectiveness of these interventions will be important in order to make informed decisions.

Aims

This analysis aimed to assess the long-term cost-effectiveness of once-weekly semaglutide 1 mg versus empagliflozin 25 mg for the treatment of patients with type 2 diabetes mellitus with inadequate glycemic control on metformin monotherapy from a healthcare payer perspective in Bosnia and Herzegovina, Greece, and Slovenia.

METHODS

- Cost-effectiveness was evaluated using the IQVIA CORE Diabetes Model (version 9.0), with clinical and cost outcomes projected over a 50-year time horizon.
- The baseline patient characteristics and treatment effects of once-weekly semaglutide 1 mg and empagliflozin 25 mg were based on an indirect comparison conducted using patient-level data (Table 1) [3].

Table 1 Treatment effects associated with once-weekly semaglutide 1 mg and empagliflozin applied in the model

Parameter	Mean (standard error)	
	Once-weekly semaglutide 1 mg	Empagliflozin 25 mg
HbA1c (%)	-1.44 (0.03)*	-0.83 (0.05)
HbA1c (mmol/mol)	-15.7 (0.3)*	-9.1 (0.5)
Systolic blood pressure (mmHg)	-4.11 (0.36)	-4.48 (0.56)
Diastolic blood pressure (mmHg)	-1.27 (0.23)	-2.39 (0.37) [†]
Total cholesterol (mg/dL)	-6.15 (0.90)*	4.14 (1.39)
HDL cholesterol (mg/dL)	1.53 (0.22)	2.63 (0.34) [†]
LDL cholesterol (mg/dL)	-2.48 (0.77)*	4.18 (1.19)
Triglycerides (mg/dL)	-31.16 (3.36)*	-15.13 (5.17)
BMI (kg/m ²)	-1.92 (0.06)*	-1.32 (0.09)

BMI, body mass index; HbA1c, glycated hemoglobin; HDL, high-density lipoprotein; LDL, low-density lipoprotein. *Statistically significant improvement with oral semaglutide 14 mg versus empagliflozin 25 mg at 95% confidence level. [†]Statistically significant improvement with empagliflozin 25 mg versus oral semaglutide 14 mg at 95% confidence level.

- In the modeling analysis, when HbA1c exceeded 7.5% the patients discontinued once-weekly semaglutide 1 mg or empagliflozin 25 mg and initiated basal insulin treatment.
- Country-specific costs of medications and complications were applied, with costs accounted from a healthcare payer perspective in 2019 euros in each analysis.
- Country-specific discount rates were applied to projected outcomes.
- Utilities from published sources were applied to calculate quality-adjusted life expectancy.

RESULTS

- In Bosnia and Herzegovina, Greece, and Slovenia once-weekly semaglutide 1 mg was associated with increased life expectancy and increased quality-adjusted life expectancy compared with empagliflozin 25 mg.
- Once-weekly semaglutide 1 mg was associated with an increase in life expectancy of 0.10, 0.12, and 0.13 years in Bosnia and Herzegovina, Greece, and Slovenia, respectively, compared with empagliflozin 25 mg.
- Quality-adjusted life expectancy was projected to increase by 0.19 quality-adjusted life years (QALYs) in Bosnia and Herzegovina, and increase by 0.21 years in Greece and Slovenia.
- Treating patients with once-weekly semaglutide 1 mg in Bosnia and Herzegovina and in Slovenia was associated with mean cost increases of EUR 853 and EUR 880 per patient, respectively, compared with empagliflozin 25 mg. The increased pharmacy costs of once-weekly semaglutide 1 mg were partially offset by avoided complication costs.
- In Greece, treating patients with once-weekly semaglutide 1 mg was associated with cost savings of EUR 1,767 per patient compared with empagliflozin 25 mg, as increased pharmacy costs were entirely offset by avoided complication costs.
- Once-weekly semaglutide 1 mg was considered dominant versus empagliflozin 25 mg in Greece, and was considered cost-effective with incremental cost-effectiveness ratios of EUR 4,397 and EUR 4,122 per QALY gained in Bosnia and Herzegovina and Slovenia, respectively (Table 2).

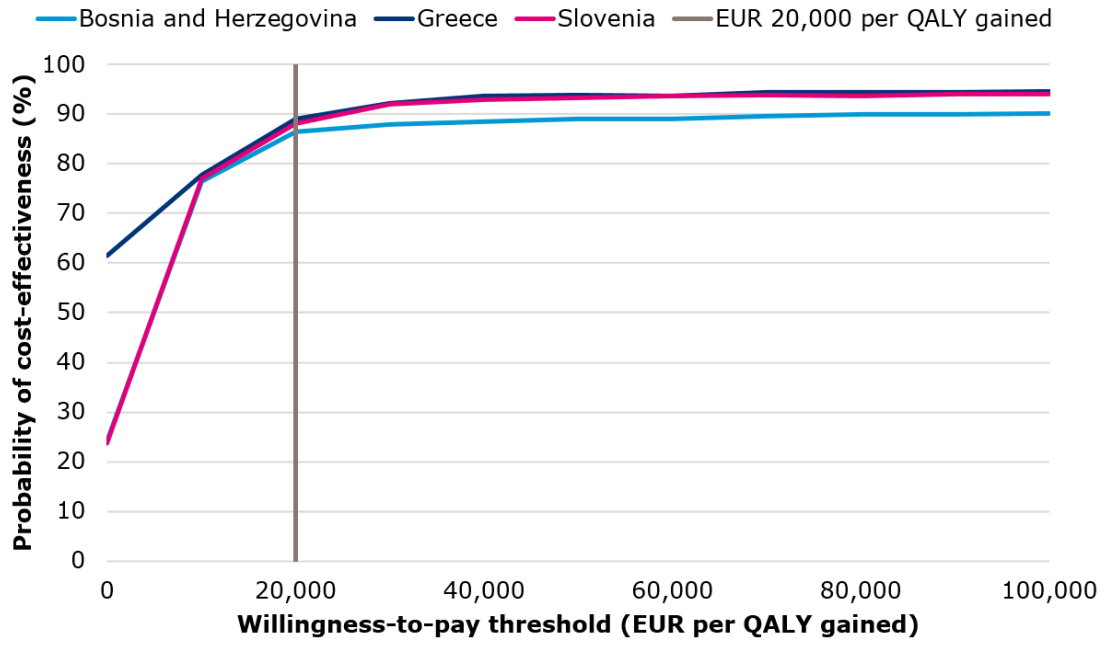
Table 2 Results of the base case analyses

Outcomes	Quality-adjusted life expectancy difference (QALYs)	Cost difference (EUR)	ICER (EUR per QALY gained)
Bosnia and Herzegovina	+0.19	+853	4,397
Greece	+0.21	-1,767	Oral semaglutide dominant
Slovenia	+0.21	+880	4,122

EUR, euros; ICER, incremental cost-effectiveness ratio; LE, life expectancy; QALY, quality-adjusted life year.

- At a willingness to pay threshold of EUR 20,000 per QALY gained, there were chances of 86.4%, 89.0% and 88.2% that once-weekly semaglutide 1 mg was considered cost-effective in Bosnia and Herzegovina, Greece, and Slovenia, respectively (Figure 1).

Figure 1 Cost-effectiveness acceptability curves



EUR, euros; QALY, quality-adjusted life years.

DISCUSSION AND CONCLUSIONS

Discussion

- Over a patient's lifetime, treatment with once-weekly semaglutide 1 mg was associated with increased quality-adjusted life expectancy compared with empagliflozin 25 mg, as a result of fewer diabetes-related complications.
- The analysis used an indirect comparison using patient-level data, which allowed potential prognostic factors and effect modifiers to be balanced, which is not possible when aggregated data is used. However, it should be noted that effect modification is not typically controlled for in the same way as confounding variables.
- Furthermore, the use of individual patient data allowed a wider range of outcomes to be assessed (such as lipid parameters), that would not be possible based on published trial data as these are infrequently reported in the peer-reviewed literature, giving a more accurate reflection of the differences in risk factors for diabetes-related complications.
- It should be noted that the model did not take into account the cardiovascular benefits observed with once-weekly semaglutide and empagliflozin in the recent cardiovascular outcomes trials [5,6].
- Moreover, while the present study evaluated only one clinical treatment pathway (intensification from a GLP-1 receptor agonist or SGLT-2 inhibitor to basal insulin) and excluded other potential algorithms, this simplified approach was used to answer the research question on the relative cost-effectiveness of the two interventions.
- A potential limitation of the present analyses is the projection of long-term outcomes from short-term data, but this is an essential tenet of health economic modeling and it remains one of the best available options to inform decision making in the absence of long-term clinical trial data.
- Additionally, every effort was made to minimize uncertainty, primarily by using a model of diabetes that has been extensively published and validated against real-life data [4].

Conclusions

In Bosnia and Herzegovina, Greece, and Slovenia, once-weekly semaglutide is likely to be to be a cost-effective therapy from a healthcare payer perspective compared with empagliflozin 25 mg for the treatment of patients with type 2 diabetes with inadequate glycemc control on metformin monotherapy.

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ABSTRACT

OBJECTIVES

Healthcare providers must choose cost-effective therapies for type 2 diabetes in order to optimize health outcomes with limited resources. This analysis assessed the long-term cost-effectiveness of once-weekly semaglutide 1 mg versus empagliflozin 25 mg for the treatment of patients with type 2 diabetes mellitus with inadequate glycemic control on metformin monotherapy from a healthcare payer perspective in Bosnia and Herzegovina, Greece, and Slovenia.

METHODS

The IQVIA CORE Diabetes Model was used to project outcomes over patient lifetimes, with baseline patient characteristics and treatment effects of once-weekly semaglutide 1 mg and empagliflozin 25 mg based on an indirect comparison conducted using patient-level data. In the modeling analysis, both therapies were discontinued and basal insulin initiated when glycated hemoglobin exceeded 7.5%. Country-specific costs of medications and complications were applied, as were utilities. Country-specific discount rates were applied to projected outcomes.

RESULTS

Over patient lifetimes, once-weekly semaglutide 1 mg was associated with quality-adjusted life expectancy increases versus empagliflozin 25 mg of 0.19, 0.21, and 0.21 quality-adjusted life years (QALYs) in Bosnia and Herzegovina, Greece, and Slovenia, respectively. In Greece, cost savings due to avoided complications entirely offset increased pharmacy costs, with once-weekly semaglutide associated with cost savings of EUR 1,767. In Bosnia and Herzegovina and Slovenia, increased pharmacy costs were only partially offset by avoided complication costs, with once-weekly semaglutide associated with mean cost increases of EUR 853 and EUR 880, respectively. Once-weekly semaglutide was considered dominant versus empagliflozin in Greece, and was associated with incremental cost-effectiveness ratios of EUR 4,397 and EUR 4,122 per QALY gained in Bosnia and Herzegovina and Slovenia, respectively.

CONCLUSIONS

In Bosnia and Herzegovina, Greece, and Slovenia, once-weekly semaglutide is likely to be a cost-effective therapy from a healthcare payer perspective compared with empagliflozin 25 mg for the treatment of patients with type 2 diabetes.

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